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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JULY 21, 1945

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Fastest Fighter
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A SCIENCE SERVICE PUBLICATION

These scientists are working for you



A G-E SCIENTIST, winner of the Nobel prize, studies oil films in a pan of water. And out of this research comes a clue to make glass invisible, to make metals stronger, to create a fog by machine.

Engineers working with certain kinds of radio waves run a temperature. A G-E fever machine utilizes this principle, so doctors can treat patients with artificially created fevers.

This page of pictures isn't one-hundredth part of what is going on at General Electric. But you will see a few ways in which life can be made easier, healthier, and happier. And that's what we are trying to do. *General Electric Company, Schenectady, New York.*

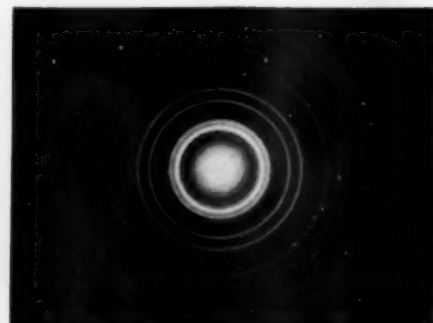


Worst weather in the world is found atop Mt. Washington, N.H., where ice feathers like these sometimes grow three feet in a single night, and where G-E scientists are conducting cold weather research for the Air Forces.

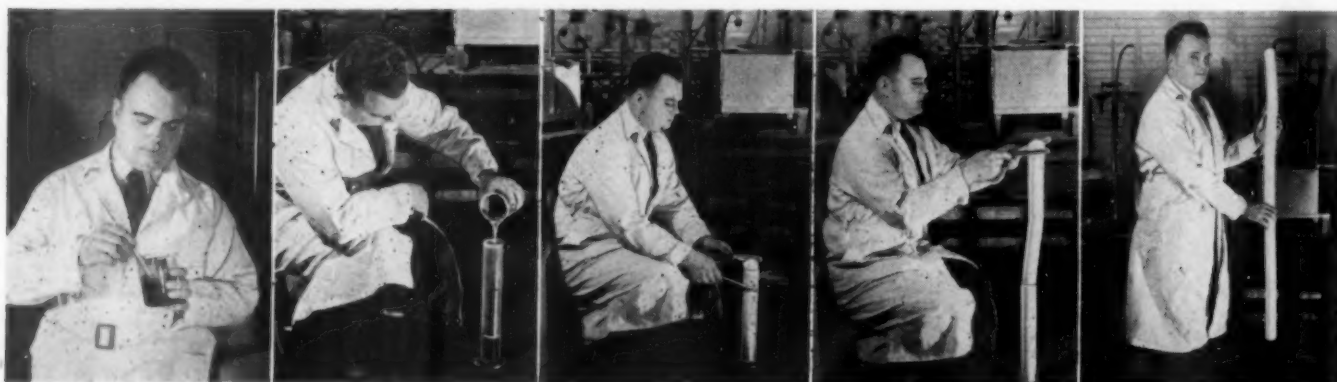
General Electric devices are helping the Signal Corps, the Weather Bureau, and the Air Forces predict the weather all over the world. Accurate weather prediction aids troop movements, saves crops, protects you.



Ever see pure vitamins? These three pinches of vitamin crystals in the hand of a G-E scientist are enough carotene, vitamin C, and thiamin to supply the average man for one day. Research at G-E Consumers Institute helps improve diet, make food taste better.



Electrons took this photo. This picture of gold, made by shooting electrons through a gold sheet less than one-millionth of an inch thick, was made in the G-E Research Laboratory, where scientists are studying metals to make new stronger combinations.



You can actually see it grow. New G-E foam plastic grows like magic at the rate of an inch a second from a liquid resembling molasses.

When it stops growing, it's ready for use. Lighter for its size than a loaf of bread, it promises to have many uses after the war.

Hear the G-E radio programs: *The G-E All-girl Orchestra*, Sunday 10 p. m. EWT, NBC—*The World Today* news, Monday through Friday 6:45 p. m. EWT, CBS—*The G-E House Party*, Monday through Friday 4:00 p. m. EWT, CBS.
FOR VICTORY—BUY AND HOLD WAR BONDS

GENERAL ELECTRIC

ASTRONOMY

Eclipse Report

Weather favored all except the most elaborate expedition in Canada where totally eclipsed sun was hidden behind cloud banks.

By CHARLES A. FEDERER, Jr.
Harvard College Observatory

Wiring from Bredenbury, Saskatchewan

► PERFECT weather conditions favored practically all places along the path of the moon's shadow from Butte, Montana, to Pine River, Manitoba, except at Bredenbury, Saskatchewan, where was located probably the most elaborate eclipse expedition ever assembled. It was in this region that most amateur and professional astronomers were gathered to observe the total eclipse on Monday, July 9.

Three miles southeast of Butte the group from the New York Amateur Astronomers Association saw the sun totally eclipsed only 14 minutes after sunrise and carried out a perfect set of observations with motion picture and still cameras. A diamond ring was observed at second contact, the beginning of totality, which was not reported by other observers along the path. At Wolseley, however, Dr. Roy K. Marshall, leader of an expedition from Philadelphia, saw the diamond ring at the end of totality.

The Philadelphia expedition, which included Dr. Orren Mohler of the McMath-Hulbert Observatory and Dr. Richard Sutton of Haverford College, took satisfactory photographs with a 40-foot camera, an 18-foot camera and two cameras of 28 inches focal length. Dr. Marshall described the corona as of typical minimum type, with short polar plumes and longer equatorial streamers, looking like the flame of a kerosene lamp extending from each side of the sun.

At Francis, somewhat south and west of Wolseley, observers from Regina had favorable skies. They saw several groups of spots on the sun before eclipse and "Bailey's beads" at both contacts. At Pine River, Yerkes Observatory astronomers W. A. Hiltner and S. Chandrasekhar were fortunate to have a cloudy sunrise turn into a clearly seen eclipse. Dr. Hiltner also described the corona as of the minimum type.

"Bailey's beads" were seen at second contact by C. M. Prinslow, of the Milwaukee amateur group, who timed the total eclipse as lasting 37.2 seconds, just about as long as predicted for that sta-

tion. With a low-power eyepiece, Dr. Hiltner observed many small prominences and some large ones.

The Milwaukee amateurs accomplished their purpose of taking an accurately-timed photograph of the solar spectrum changing into the flash spectrum, this being expected to be of value in timing the moon's motion, especially if similar successful results are obtained by eclipse observers in Sweden and Russia.

Most observers noticed Venus so bright it was seen after totality had ended, while Aldebaran, a first magnitude star near by, was also seen by many. Saturn, close to the sun, was a most noticeable object.

By DR. JOHN Q. STEWART
Princeton University Observatory

and JAMES STOKLEY
General Electric Research Laboratory

Wiring from Butte, Montana

► THE TOTAL solar eclipse seen Monday morning, July 9, took place during 11 minutes of clear sky, which enabled us to make our observations while the sun was passing from behind one cloud bank to another.

About 125 people from Malta motored with us before sunrise to a knoll in the

prairie 15 miles to the south. Half of this number actively aided visual observations by Dr. John Q. Stewart, and 15 other persons tended to confirm the existence of the globular corona first described in the 1937 eclipse.

The streamers of the sun's corona which flashed out brilliantly and sharply during the 30 seconds of totality seemed to be imbedded in a general hazy luminosity surrounding the sun. The phenomenon of the "falling shadow," characteristic of a sunrise eclipse and not previously described, was satisfactorily observed, although the general overcast of altocumulus clouds made the passage of the moon's shadow in the atmosphere less spectacular than it would have been with clear skies.

It was a dark eclipse and markings on a camera dial could not be read during totality. On account of the clouds, stars could not be seen. The color effects were most impressive and of a kind never duplicated at ordinary sunrises or sunsets. During the eclipse the sun was only seven degrees above the northeastern horizon, and underneath it, there could be seen a saffron glow from sunlit air beyond the boundary of the moon's shadow.

Approximately 36 photographs of the corona and the moon's shadow on the clouds, many of them in color, were taken. Some were by Dr. Ira M. Freeman, astrophysicist, working on wartime research at Princeton University, and Mrs. Freeman. This number includes photographs taken by James Stokley with a special camera designed by Frank Benford of the General Electric Research Laboratory which records the entire sky,



COMPARISON—A huge B-29 Superfortress and a tiny L-5 Liaison type airplane are parked beside each other on the flight apron at Harvard Field, Nebraska. Overall length of the Superfortress is 99 feet against the L-5's 24 feet, 1 inch. U. S. Army Air Forces photograph.

and exposures made from an airplane by James L. Artig, Jr., astronomy student at University of Minnesota. Mr. Artig, who was piloted by Harold Ebaughnat to an altitude of 9,000 feet, reported that a band of condensed water vapor perhaps 15 miles wide formed during totality along the central part of the shadow

track. This did not disappear through evaporation until several minutes after the sun reappeared. The plane flew about 2,000 feet under the clouds, but was maneuvered to a clear space where an excellent view of the corona was obtained.

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MEDICINE

Record-Breaking Recovery

A Marine who had 83% of his body surface burned went back to duty within three months. Up to the present war, similar burns have usually been fatal.

► **BREAKING** most if not all records for recovery from extensive burns is a case reported by Lt. Comdr. John R. Johnson, of the Navy's Medical Corps, in the *Naval Medical Bulletin* (July).

The 19-year-old marine had 83% of his body burned in a gasoline explosion. Up to the present war, first degree burns involving two-thirds of the body surface and second degree burns in adults involving one-third of the body surface were generally fatal. Within three months after the injury, Lt. Comdr. Johnson's patient had not only recovered but returned to duty.

When this young man was brought to the hospital four hours after the explosion, he had second and third degree burns over all of his body except the part of his head covered by thick hair, the short edges of which had been burned; his feet and ankles which were covered by field shoes; and the part of his body which was "clothed in abbreviated shorts." He also suffered inhalation burns of his lungs.

The patient was excited and in shock. His recovery was complicated by dropsy, hemoconcentration (thickening of the blood), merging into a stage of infection, progressive anemia, thrombophlebitis of both legs, and a clot in a lung artery with death of part of the lung tissues.

Treatment included blood plasma and albumin, sufa drugs, penicillin, nasal tube feeding blood transfusion, oxygen during the lung involvement, vaseline-paraffin impregnated gauze dressings on the extremities, vaseline-paraffin spray over the trunk, sufatiazole ointment on the face and skin grafts.

The skin grafting had to be delayed a week or two beyond the best time for this procedure until enough burned areas had healed to make skin available for grafting onto other areas.

The patient was allowed out of bed

the 46th day after injury and evacuated to the rear as a walking patient with his burns completely healed on the 62nd day. He returned to duty one month later.

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PHYSICS

Thoriated-Tungsten Wire Tested by Simple Device

► A NEW technique developed by scientists of the Radio Corporation of America, has reduced by more than 87% the time required for checking thoriated-tungsten wire to insure its efficiency when used for filaments in radio transmitting tubes.

Taking advantage of the radioactive properties of thorium, the new method employs a Geiger counter to indicate, by audible signals the presence and adequacy of the thorium content of the wire. This procedure represents a decided simplification of the former method, which was dependent on spectrographic analysis. The latter method required a skilled operator; the new technique can be applied by an average factory worker.

The Geiger counter, generally regarded as a laboratory instrument heretofore, was successfully enlisted in war production at RCA's electron tube manufacturing plant at Lancaster, Pa., following a series of experiments conducted by G. R. Feaster, RCA physicist. Through the cooperation of Dr. J. R. Dunning, of Columbia University, Mr. Feaster was enabled to use Columbia's equipment for the early experiments.

A qualitative check of all thoriated-tungsten wire is necessary to eliminate costly errors which would result if unthoriated wire should be mistakenly substituted for the thoriated wire; but the spectrographic analyses formerly used were time-consuming, even on a pro-

duction basis, and required the services of a skilled operator.

Factory experience with the new technique, using equipment manufactured under the direction of H. A. Glassford, of Columbia University, shows that eight days of testing by the former method may now be run in a single day. The use of a pre-scaling loudspeaker monitor permits the average factory worker to detect the radioactivity of a spool of thoriated wire in a few seconds. By means of a scale-of-sixteen counting circuit and counter, semi-quantitative determinations can be made when desired.

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MEDICINE

Amputations Avoided

Penicillin injections into artery are advised for severe infections of arms and legs. Success with this method in 24 cases is reported.

► AMPUTATIONS may be avoided and severe infections of hands, feet, arms or legs cleared up when penicillin is given by injection into an artery instead of by other methods.

Success with this method in 24 cases, believed the first treated in this way, is reported by Dr. S. Thomas Glasser, Dr. John Herrlin, Jr., and Dr. Boris Pollock, of New York Medical College and the Flower-Fifth Avenue and Metropolitan Hospitals, in the *Journal of the American Medical Association* (July 14).

One injection may cure cases of infection and inflammation without pus formation and discharge and without death of tissues, the doctors report.

Pain is often greatly relieved following the first injection. When amputation is necessary, it may be frequently possible to save more of the leg or arm, hand or foot than would otherwise be saved.

Infection complicating diabetes and arteriosclerosis, which often results in gangrene requiring extensive amputation, is a condition for which the artery injections of penicillin are particularly recommended. The doctors believe it would also be particularly helpful in war wounds of the extremities.

Less penicillin is needed when given by injection directly into an artery than when given by injection into a vein or muscle or by mouth or local application. Instead of giving injections every three hours round the clock, as is often necessary, only one injection was given on any day in the 24 cases reported.

Injecting the drug into the artery is believed a most efficient way of concentrating it in the part of the body where the infection is located.

Very impressive to the doctors was the case of a 70-year-old man who had necrotic ulcers of his right foot, hardening of the arteries, diabetes and infection. Such a condition "is always regarded with alarm," they point out. This man was given two artery injections, four days apart, of 50,000 units of penicillin each.

"Improvement was prompt and granulations (formation of new flesh) appeared at the ulcer sites within one week," the doctors report. Commenting further

on this case, they state:

"Penicillin prevented extension of infection and we are impressed by the rate of healing which, although delayed by arteriosclerosis, is nevertheless far more rapid than we have ever observed under any other method of treatment."

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PLANT PATHOLOGY

Wilt-Resistant Tomatoes Produce Disease Weapon

► TOMATO plants resistant to the destructive fungus disease known as wilt have been shown to produce a penicillin-like substance that stops the growth of the deadly fungus under closely controlled laboratory conditions, by the experiments of a three-man research team at the great Beltsville experiment station of the U. S. Department of Agriculture. First report of these experiments is given in *Science* (July 6) by Dr. George W.

Irving, Jr., Dr. Thomas D. Fontaine and Dr. S. P. Doolittle.

Since some strains of tomatoes are highly resistant to wilt and others are not, it seemed reasonable to conjecture that the resistant kinds contained something hostile to the growth of the fungus. The three men squeezed the juice out of many tomato plants, put it through necessary filtering and purification processes, and then exposed growing masses of the wilt fungus to its action in carefully measured quantities. In all cases, the degree to which the fungus growth was checked corresponded rather closely to the known wilt-resistant qualities of the plant from which the juice was taken.

The new-found fungus-stopping substance has not been isolated in pure form, so that its exact chemical nature is still unknown. Some facts about its chemical and physical properties, however, have already been uncovered.

It is present in all parts of growing resistant plants. It has not been found in tomato seeds, but appears in the seedlings very soon after they sprout. Concentration varies somewhat according to age of the plant, also from part to part.

Because the generic name of the tomato is *Lycopersicum*, the fungus-stopping substance has been given the name lycopersicin.

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TERMITE PROOF—At this wood-preserving plant for the Navy's advance bases, these tent poles are ready for pressure treatment with Wolman salt solution which will ward off attack by termites and fungi. Wooden poles, canvas and even tent poles are given chemical treatment for protection against fungi, mold and termites.

AERONAUTICS

Three New Fighter Planes

They are for use in the war against Japan, and include the jet-propelled plane with speed of 500 miles an hour and fastest propeller-driven plane.

► **THREE NEW** fighting planes for war on Japan have been revealed by the Society of British Aircraft Constructors, Ltd. They are the jet-propelled de Havilland Vampire, the twin-engined de Havilland Hornet, and the single-engined Vickers-Armstrong Spitfire. Two other new planes have also been announced, a four-engined Avro Lincoln bomber and a twin-engined Miles Aero-van freight carrier.

The jet-propelled Vampire was the first aircraft in the world to fly at more than 500 miles an hour, the Society states. It is today the fastest plane in service in the world. It is a single-seater, powered by a single gas turbine engine. As it is to be used against Japan, further details remain secret.

The new Hornet, although twin-engined, can be maneuvered with the ease of a single-engined plane. It is claimed to be the fastest propeller-driven aircraft in the world, having a top speed of 470 miles an hour. It is somewhat smaller,

as well as faster, than the famous Mosquito made by the same company.

The Spitfire is a version of the well-known Spitfire, or its Navy cousin, the Seafire. It is a faster plane, however, and has a top speed of more than 460 miles an hour.

The new Lincoln is a big brother of the Lancaster which carries the biggest bomb-load of any aircraft in the world, according to the Society. It has a considerably increased range over the Lancaster, and has higher speed.

The cargo-carrying Aero-van, not designed as a warplane, has a freight-car-shaped body with deep straight sides, and a rounded nose and a sharply tapered rear section. It loads and unloads at the rear. It carries a ton of freight at a speed of somewhat over 100 miles an hour. It can take off or land with a run of from 300 to 800 feet, depending upon load, and it can be used where prepared aerodromes do not exist.

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ORDNANCE

Flame Jets Pierce Armor

► **THE TERRIFIC** tank-killing power of the bazooka's small rocket missile is not due to its being packed to the limit with a super-high explosive, nor yet to the projectile's ability to plunge through a steel wall. Its velocity is actually very low—you can actually see it as it sails through the air—and more than half the head is simply empty space.

But that empty space is so cunningly disposed that the effect of the few-ounce charge of high explosive is literally that of a fiery sword. What actually goes through the steel is a thin tongue of hard, naked flame, it is explained in *Army Ordnance* (July-Aug).

Outside of professional circles, the thing that gives the bazooka projectile its real power is still very little understood or appreciated, the editor comments. If a solid mass of explosive is detonated outside a steel or concrete wall, it spends itself in a flat blast. But if there is a conical hollow in the charge, with its open end facing the wall, a terrific

piercing effect will be generated by the converging detonation waves coming from the sides of the conical hollow, and will drive a jet of flame right through the armor.

Possibilities of what have come to be known as "shaped charges" were first discovered by an eminent Washington scientist, the late Dr. Charles E. Munroe, who spent many years in research on explosives for various government agencies. Some civilian uses were made of his discovery, now called the Munroe effect, in special-type blasting operations. Dr. Munroe died before the outbreak of the present war.

First suggestion of a military application of the Munroe effect was made by a young Swiss engineer, Henry H. Mohaupt, who came to this country with the germ of the idea in 1940. During 1941 he worked with the Ordnance Department of the U. S. Army, evolving what eventually became the bazooka projectile. Mr. Mohaupt later enlisted in the

Army and served in the ranks of the Ordnance forces. He ran into the normal amount of skepticism, but had the backing of two able officers, Brig. Gen. R. H. Somers and Col. K. F. Adamson. When his hollow-head charges were tried against armor the results were sensational.

Projectiles embodying the Munroe effect are now used by all armies, enemy as well as Allied, and in all kinds of weapons—rockets, artillery shells, rifle grenades, as well as mines and hand-placed demolition charges.

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AERONAUTICS

The New Corsair Is Speediest Plane in Navy

See Front Cover

► **THE NEW** Navy Corsair, fighter and bomber, shown on the cover of this *SCIENCE NEWS LETTER*, already in use in the demolition of Japan, is the speediest plane in the Navy with a speed of 425 miles an hour, and it can be used from airfields or from carriers. Rapid climbing ability is one of its special qualities as well as speed. Although hundreds have left the assembly line, it has been a closely guarded secret until now.

The new plane is a composite improved model of all the earlier Corsairs. Its four-bladed propeller, over 13 feet from tip to tip, driven by a single 2,100 horsepower Pratt-Whitney engine, gives it the tremendous speed, and an increased ability to climb almost 1,000 feet a minute over its predecessors. It has maneuverability, and is easy to land.

Six 50-caliber machine guns are carried in the wings of the new Corsair, and it can carry a load of 2,000 pounds of bombs or rockets. It has the most modern radio equipment in use with which the pilot can change radio frequencies by pushing a button instead of twisting a knob.

The major change in the new Corsair, which was designed by Chance Vought Aircraft and in addition to being built by that company is to be constructed by Goodyear Aircraft, is the incorporation of the Pratt-Whitney Double Wasp 2800-C engine. Very little weight has been added, so nearly all the added horsepower has been transformed into increased speed, climb and ceiling, three of the four basic criteria of air combat. The fourth is maneuverability, with which the new plane is well supplied.

The new Corsair in the Navy is the Chance Vought F4U-4.

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PHYSIOLOGY

POWs Recover Quickly

Liberated American prisoners of war are recovering quickly and fully from starvation. No permanent ill effects in uncomplicated cases, Army reports.

► **LIBERATED** American prisoners of war are recovering quickly and fully from the malnutrition caused by starvation in Nazi prison camps. They will not suffer permanent ill-effects if the starvation was not complicated by other conditions.

This reassuring news is based on a special study of 275 severe cases of malnutrition of liberated American prisoners of war hospitalized during the month of April at the 217th General Hospital in Paris. Results of the study were announced through the Office of the Surgeon General, U. S. Army.

The patients were received at the hospital three to seven days after their liberation and treatment was immediately started.

"A survey was made to determine the average daily gain of weight in uncomplicated malnutrition cases and those who had lost more than 25 pounds gained an average of 1.2 pounds per day during an average observation period of 25 days," said Lt. Col. Don C. Wakeman, Topeka, Kans., Chief of Medical Service of the hospital.

Starvation is manifested chiefly by marked loss of weight, which in some instances was more than 100 pounds. In addition to loss of weight, a number of other symptoms and signs result from malnutrition which are due to deficiencies of proteins or vitamins.

Treatment in milder cases consisted of feeding a high caloric and high vitamin-containing diet divided into six meals per day and giving supplementary vitamin preparations to those who presented evidence of specific vitamin deficiency states. The more severe cases were unable to tolerate sufficient quantity of food to allow recovery from feeding alone. In these cases, intravenous solutions (feeding by vein), common blood plasma and transfusions of whole blood were necessary to get the patients over the first stage and put them in a condition where food would be tolerated.

X-ray studies of patients with nausea, vomiting, diarrhea and intolerance to food revealed marked changes in the functions of the small intestines which resembled the disease known as "sprue."

Under adequate treatment these changes showed considerable improvement within two weeks.

Blood plasma was especially valuable because one of the common effects of starvation is a decrease of blood plasma level and many of these symptoms of the deficiency are secondary to a depletion of proteins. A few units of plasma and several blood transfusions, supplemented by vitamin therapy, would produce sufficient improvement to enable the severe cases to tolerate food.

It is possible to have an irreversible state of malnutrition in which no treatment will be of any value. Such cases are rare. Only one death was reported in this category in over 1,100 cases admitted to the hospital.

As a result of starvation, an individual loses much of his resistance to infections. The incidence of infectious diseases was very high in the German prison camps and many of the liberated Americans had tuberculosis and jaundice. Some had rheumatic fever. Many had had diphtheria, and post-diphtheritic polyneuritis and myocarditis were common.

Although mental changes are considered to be common in pellagra, no severe mental disturbances which were a direct result of starvation were found.

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CHEMISTRY

Fungus Chemical Checks TB Germs in Test Tube

► **DISCOVERY** of still another fungus chemical which might be developed into a remedy against tuberculosis is announced by Joseph M. Kurung, of the New York State Hospital for Incipient Pulmonary Tuberculosis (*Science*, July 6).

The fungus substance definitely stops the growth of tuberculosis germs growing on culture medium in the laboratory. It withstands high temperatures well and keeps for several months at below freezing temperatures. Tests with mice show that it is relatively non-toxic, suggesting that it could be used safely as a remedy.

Before attempting to establish its value



STRAWBERRY PATCH!—Plants growing out of the top and from holes in the sides of a barrel—this is the way to grow your own berries on your apartment room, your city backyard, in the center of your flower bed or at the kitchen door on your farm. Mrs. J. N. Newsom, of Virginia, is shown watering the vines by means of an open perforated pipe in the center. Planting can be done in the spring or fall. Pick whenever you see a ripe berry.

as a weapon against tuberculosis, Mr. Kurung believes the substance should be obtained in a more pure form and is now working on this purification.

The material was obtained from a strain of the fungus called *Aspergillus ustus*. Substances active against tuberculosis germs growing outside the body have been obtained from other fungi and molds, including *Aspergillus fumigatus*, *Actinomyces griseus* and one of the *Penicillium* group, Mr. Kurung points out.

None of these various antibiotics, as they are called, has yet been accepted as a remedy for tuberculosis. Scientists are still working to assess the ability of some of these substances to check the growth of tuberculosis germs in the human body without themselves causing any damage.

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Prunings of fruit trees should be burned or they may become sources of infestation.

CHEMISTRY

Penicillin Causes Changes In Blood Clotting

► **DISCOVERY** of a change in blood clotting caused by penicillin, pointing both to possible danger and possible further benefits from the mold chemical, is announced by Maj. Leon F. Moldavsky, Capt. William B. Hasselbrock and Lt. Carlos Cateno of Harmon General Hospital (*Science*, July 13). Private Darrell Goodwin gave technical assistance in the studies.

The danger is that of thrombus or clot formation in the veins of patients getting penicillin, especially with the recent tendency to use larger doses.

The benefit would be use of penicillin in bleeding disorders such as hemophilia, though that hereditary bleeders' disease is not mentioned in the report.

Penicillin, the Army group found, speeds coagulation of the blood to such an extent that sometimes blood taken from a patient for study clotted in the syringe before it could be expelled.

"Even more startling" they report, is the change caused in the nature of the blood clot itself when penicillin has been given. The blood clot does not retract. The blood itself is dark and exceedingly viscous in its flow. When coagulation is complete it appears solidified, looking like an artificially produced, solid thrombus or blood clot.

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ORDNANCE

Two Navy Laboratories At Pennsylvania State

► **TWO** permanent ordnance research laboratories for the U. S. Navy will be in operation at Pennsylvania State College by fall.

One of these will investigate underwater weapons and will continue Navy underwater sound research formerly carried on at Harvard University under the sponsorship of the Office of Scientific Research and Development. Dr. Eric A. Walker will direct this new laboratory and also head the Electrical Engineering Department of the College. Assistant directors will be A. N. Butz, Jr., R. R. Thompson, and Dr. Harvey Brooks, all now affiliated with the Harvard University Laboratory. Approximately 125 scientists, technicians, and clerks will be transferred from Cambridge to the new unit.

The laboratory will operate a new building on the campus, a station on

Black Moshannon Lake 20 miles from State College, and a test station at Fort Lauderdale, Florida.

The Navy is also sponsoring a program on petroleum research that has been conducted in Pennsylvania State College's Petroleum Refining Laboratory for sixteen years. Dr. M. R. Fenske will continue as director, with more than 50 chemists, chemical engineers, and technicians on the staff.

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CHEMISTRY

Rubber Protected from Chemical Damage by Copper

► **COPPER** is still the best all-round conductor for electricity, and rubber the best insulator for copper wire. However, like many an otherwise advantageous human mating, this marriage is not a happy one: copper constantly subjects rubber to a kind of chemical nagging, causing it to deteriorate and also staining it if the insulation is light-colored.

To protect rubber against the ill effects of too-constant companionship with copper, Dr. Albert W. Meyer of Nutley, N. J., has developed a thin coating of a synthetic plastic to go over the wire before the rubber insulation is applied. Into this plastic is incorporated one of a number of organic amines, of which the phenylene diamines are typical and which have the capacity to absorb the chemical abuse that would otherwise cause the eventual breakdown of the rubber.

On this method of insulating the insulation, U. S. patent 2,379,978 has been granted to Dr. Meyer, who has assigned it to the United States Rubber Company.

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PUBLIC HEALTH

Blue Cross Opens National Enrollment

► **THE BLUE** Cross Plans for hospital and medical care prepayment opened a national enrollment office in New York on July 16. Object of this new feature is to help in the enrollment of branch office or branch plant employees of national firms in areas served by two or more Blue Cross organizations.

Such employees, under the new arrangement, may be enrolled even if the number does not meet the minimum group requirements of the enrolling plan. Transfer of membership of the employee and his family will be accepted in cases in which employees of a nationally enrolled firm move to another city.

Science News Letter, July 21, 1945

IN SCIENCE

MEDICINE

Substance from Chest Causes Heart Disease

► **THE RIDDLE** of what causes one kind of heart disease, known medically as acute interstitial myocarditis of unknown etiology, may be on the way to solution as the result of a discovery made at the AAF Regional and Convalescent Hospital at Miami Beach, by Lt. Col. F. C. Helwig and Capt. E. C. H. Schmidt of the Army Medical Corps and reported in *Science* (July 13).

They have isolated a substance capable of causing in apes, mice, rabbits and guinea pigs a disease with heart damage "strikingly similar" to that of the acute myocarditis of unknown origin which attacks humans sporadically.

The substance, apparently not known previously, was obtained from the chest fluid and spleen of a chimpanzee that died suddenly at the Anthropoid Ape Foundation. A gibbon at the same foundation had died suddenly six weeks previously with almost identical symptoms and the same signs of heart damage.

The substance obtained from the chimp's chest and spleen after death and which caused myocarditis in small laboratory animals appears from the scientific description to be a virus, although the medical officers do not state that it is. It passes through filters as viruses do. It can be inoculated on and recovered from chick embryos. It is found in the nasal washings of inoculated animals. It produces the heart damage when introduced into the body by injection into the veins, into the brain, under the skin, into the peritoneum and by instillation into the nose.

Science News Letter, July 21, 1945

ELECTRONICS

Electronics Laboratory At Syracuse University

► **A NEW** Laboratory of Industrial Electronics has been established at the University of Syracuse which will give emphasis to the application of electronic tubes and related circuits in the field of industrial control and measurements. Both graduate and undergraduate courses will be given by the institution.

Science News Letter, July 21, 1945

NE FIELDS

GENETICS

Yeast Hybrids Produced To Improve Food Value

► **HYBRID** yeast species are the newest products of plant breeders' efforts. They have been bred for the same reason that induced the production of hybrid varieties of tomatoes, sweetcorn or any other of the more easily visible vegetables—to improve their usefulness in the human or farm-animal diet.

Yeast, taken either "raw" or processed, is usually eaten primarily for the sake of several vitamins of which it normally constitutes a highly concentrated source. Although the yeast plant consists of a single cell visible only through the microscope, yeasts are as individual in their characters as larger plants, and a number of botanically distinct species are recognized.

Some of these species, though good suppliers of certain vitamins, are poor or even completely lacking in others. For this reason Dr. Carl C. Lindegren and Gertrude Lindegren, botanists at Washington University in St. Louis, have interbred the various species, producing hybrids with more varied vitamin-producing capacities than any of the parents. They discuss their results in some detail in *Science* (July 13).

Science News Letter, July 21, 1945

AGRICULTURE

Quack Grass Has Possible Use in Animal Feeding

► **QUACK GRASS** or couch grass, notorious as an evil weed in America as well as in its native Europe, has a possible use in animal feeding, experiments reported in the science journal, *Nature* (June 2), indicate. The research was performed by W. King Wilson of the Harper Adams Agricultural College at Newport, Shropshire.

Quack grass spreads over the ground by means of quick-growing runner-like stems or rhizomes. It can be slowed, though not stopped, by pulling these loose with a rake and stacking them up to dry. But this of course involves labor costs, and no offsetting use has ever been suggested for the dead weed growths.

Mr. Wilson made chemical analyses of dried quack-grass rhizomes and found that the food substances in them com-

pared favorably with those in ordinary hay. Then he substituted them for hay in the diet of a group of rabbits, and found that the animals thrived at least as well as those of a similar group kept on hay.

Quack grass, like the vegetable criminal that it is, has a number of aliases, though they all sound more or less alike: quick grass, couch grass, twitch grass. To botanists the weed has only one name: *Agropyron repens*.

Science News Letter, July 21, 1945

CHEMISTRY

Jar Rings No Longer Give Taste of Rubber to Food

► **HOMEMAKERS** can use almost any type of red or black jar rubber on the market this season without fear that the food inside the jars will taste of rubber. Rings manufactured in 1945 will be practically free of odor and most of the older rings can be treated to prevent objectionable flavors.

The simplest treatment, reports Prof. Marion C. Pfund of Cornell University, is to boil one dozen well-washed rings for 15 minutes in one quart of water containing one tablespoonful of baking soda, or one teaspoonful of soap powder, or one-half an unpared medium-sized potato, sliced, or about the same amount of potato parings. After boiling, wash the rings again in clear hot water.

The rings should be treated the day before using. If the odor is still strong, boil the rings a second time, but use a different substance in the water from the first used. The rings are not injured, insuring a tight seal.

Widespread complaints during 1943 and 1944 about objectionable flavors in home-canned foods, traceable to the rubber rings, led to an investigation at the New York State College of Home Economics, Cornell University, financed by the New York State Emergency Food Commission. The main trouble this year, Prof. Pfund says, is that there is no way of withdrawing from the market rings that have already been distributed, some of which may have objectionable odors.

Since her investigation, she has been in touch with a group of manufacturers that represent more than 90% of the rubber-ring industry. At the instigation of the War Production Board, they have been working to overcome difficulties of making rings from re-claimed and synthetic rubber. Rings of black and red rubber that will not impart flavor to food are now being made.

Science News Letter, July 21, 1945

ENGINEERING

Automatic Conveyor System Cleans Airplane Engines

► **USED ARMY** airplane engine parts are cleaned of dirt, grease and carbon accumulated through thousands of hours of operation by the Air Technical Service Command at its Rome, N. Y. shops through the use of a new automatic conveyor system. Passing in continuous motion through solution tanks and spray washers, they are untouched by human hands during the cleaning process.

Aside from the overhead 954-foot-long conveyor driven by a two-horse-power electric motor, the principal elements of the system are four large tanks and three industrial spray washers. Engine parts as they come off the disassembly line are hung on the conveyor or placed in suspended wire baskets. External dirt and grease are flushed off first by high powered sprays of alkali solution, after which the parts pass slowly through three soak tanks and another washer which removes much of the accumulated carbon.

Then they continue into a double cleaning tank, and on into a five-stage washer. In these the final carbon is removed, an alkaline spray flushes off the fluids used, and a clear hot water spray provides final cleaning. Parts are dried by a blast of hot air.

Science News Letter, July 21, 1945

ASTRONOMY

Second Comet in 2 Months Discovered by du Toit

► **FOR THE** second time in just a day over two months, an astronomer named du Toit, on the staff of the Harvard Observatory at Bloemfontein, South Africa, has picked up a new comet. The discovery was made at 3:00 a.m., Greenwich time, on June 11, which is the equivalent of 11:00 p.m., EWT June 10, in the United States. The preceding du Toit comet was first observed on April 9.

The new du Toit comet is an inconspicuous object, of only tenth stellar magnitude, and thus invisible to the naked eye. Its position, in the southern hemisphere constellation of Sculptor, puts it out of reach of telescopes in this country.

Its position when discovered was in right ascension 1 hour 8 minutes, declination minus 20 degrees—celestial equivalents of longitude and latitude. A check on its motion showed that it was traveling fairly rapidly in a southwesterly direction.

Science News Letter, July 21, 1945

CHEMISTRY

Frocks from Feathers

Soft sweaters and fluffy white mittens woven of feather yarn will probably be the rage within a few years. The barbs and quills are used.

By MARTHA G. MORROW

► **SOFT SWEATERS** and fluffy white mittens woven of feather yarn will probably be the rage within a few years. Scarfs and belts knitted of yarn made from feather protein may some day delight the most fastidious.

More exciting materials made from the millions of chicken feathers, which are now thrown away or used as fertilizer, may result from two lines of research. One is concerned with the fluffy barbs of the feather, the other deals with the quill.

The fine feather barbs help make a delightful piece of fabric. When cut loose from the midrib of the quill, these bits of fluff may be bound together with a little wool, cotton or rayon, and woven into yarn.

Poultry feathers, which contain a protein material, are being studied, as a possible raw material from which synthetic fibers can be made. The barbs are useless in this work and must be stripped away.

Approximately 100,000,000 pounds of chicken feathers, left from preparing fliers and broilers for market, are wasted each year. Many other feathers remaining after ducks, turkeys and other fowl have been plucked are ordinarily thrown away or used as fertilizer. So scientists of the U. S. Department of Agriculture are busy trying to develop ways of preserving and using this waste material. Fabrics with definite eye appeal, long wear and specialized uses may result.

Wet feathers normally decompose too rapidly to be sent to a central place for processing. A way had to be found to ship feathers, wet and frequently covered with blood, from chicken-dressing plants to processing houses at reasonable cost.

Feathers "Pickled"

By "pickling" the feathers in a salt and hydrochloric acid solution, it was found that they can be preserved for several weeks. This treatment, which does not injure their fluffiness, enables them to reach the processing houses in good condition.

A process for "mincing" feathers has been developed by Dr. John I. Hardy of the Beltsville, Md., Research Center. After the feathers have been dried and cleaned, they are put into a hammer mill, where the barbs are broken away from the midribs and cut into short pieces. These cling to one another with thousands of microscopic hooks, forming a loose, fluffy mass.

The barbs are separated from the coarser midribs by blowing them upward in a tall tower. The light, fluffy portions float up to the top where they are collected in a bag. The coarser bits stay at the bottom and are at present discarded.

The soft, feathery bits are thoroughly mixed in a carding machine with a binder such as wool or cotton before being spun into yarn. Though themselves too short to make a strong fiber, when firmly anchored in wool, cotton or rayon, the bits make a fine, warm fabric.

When washed, the feathers retain their fluffiness and do not shrink. Feeling not

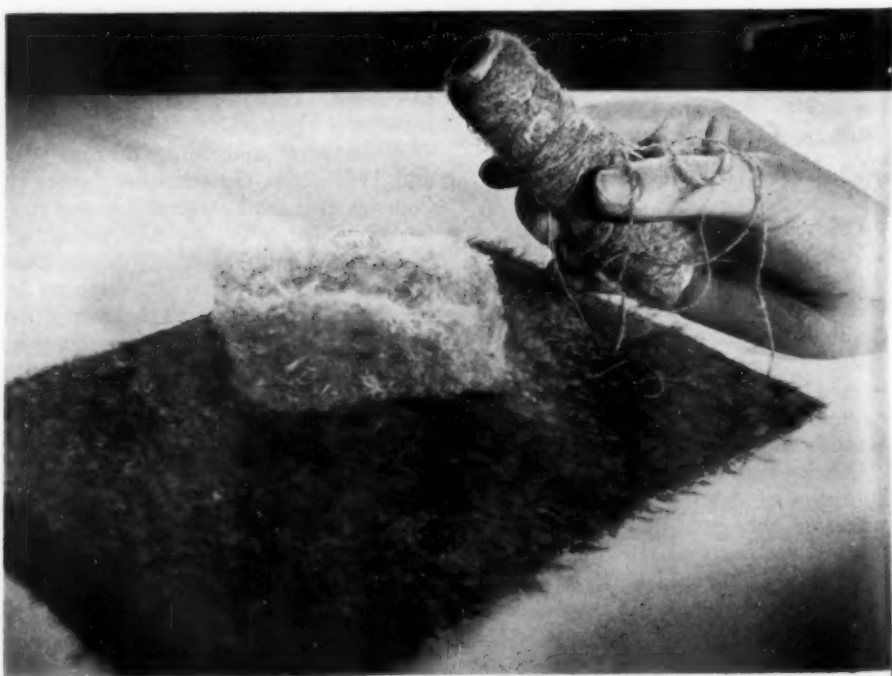
unlike angora wool, the resulting material is pleasing to the touch.

Fibers resembling silk and wool in some of their properties have been made experimentally from the protein of chicken feathers under the direction of Dr. Harold P. Lundgren of the Western Regional Research Laboratory at Albany, Calif. The extent to which the fiber can be developed commercially is at this stage unknown, but prospects are definitely promising.

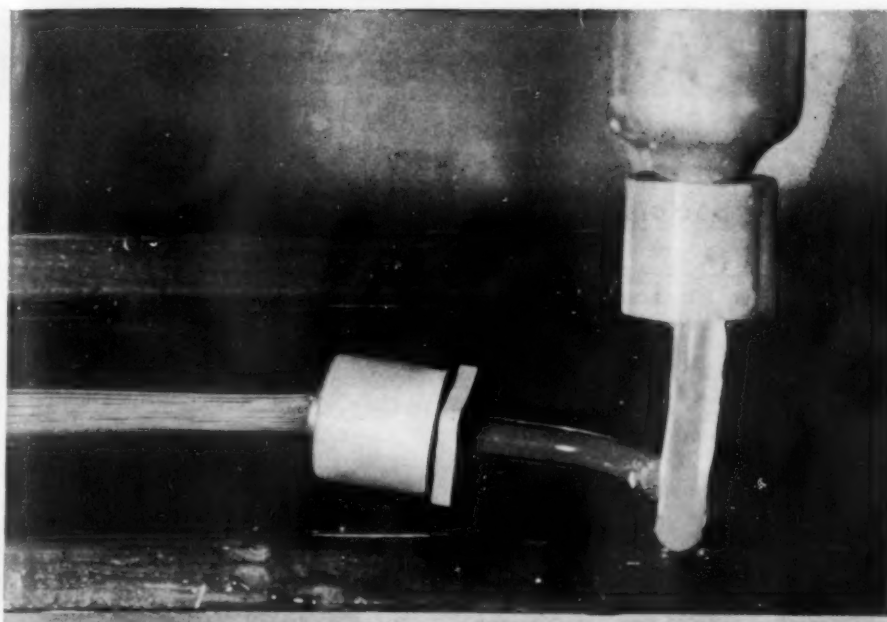
The object of the research is to liberate the long-chain protein molecules of the keratin of feathers and to re-orient them and recombine them so as to produce a fiber.

Treating the feathers with synthetic detergents such as alkyl benzenesulfonate, along with a reducing agent, has proved most successful. The detergent causes little if any damage to the chains themselves; it breaks the bonds which hold them together and attaches itself laterally along the side of the chains. It thus in a sense serves as a lubricant, permitting better control in handling the bulky protein chains.

Fibers can be made from the protein-detergent solutions in one of two ways.



FEATHER FABRICS—A pile of barbs, yarn made by binding the soft bits together with a little wool, and a piece of feather cloth are shown here.



BARNYARD PRODUCE—Fibers made from the protein of chicken feathers are drawn from a spinneret at the Western Regional Research Laboratory where Dr. H. P. Lundgren's research is being conducted.

Inorganic salt can be used to form a precipitate of subsequent drawing into a fiber, or the solution can be passed through a fine-holed nozzle into a coagulating bath where it hardens.

When the material is separated from the liquid into solid form by the use of salt, it is either slimy or soft and flaky, depending on the proportion of detergent used. The material that precipitates to the bottom, if not too slimy, can be drawn into fibers by hand.

The sticky solution may also be forced through the holes of a spinneret similar to those used in making rayon fibers. Somewhat like the nozzle of a bathroom spray, the spinneret has holes which are only three-thousandths of an inch in diameter. Upon being squirted from the spinneret, the liquid is forced into a salt bath where the fibers solidify.

Stretched and Reeled

The resulting fibers, like nylon, can be stretched and reeled. Drawn under live steam, the fibers can be stretched to over three or four times their original length.

Fibers have been made which compare favorably in strength with synthetic fibers made from casein and soybean. Chicken-feather fibers have been prepared having dry strength greater than wool and practically as strong as cotton and rayon. Along with the increased strength, the fibers also gain water resistance. Stretch-

ing, however, reduces the elasticity of the fiber.

Much study remains to be done on chicken-feather keratin before its full usefulness as a fiber can be realized. But cloth from minced chicken feather barbs isn't just a dream: it's a reality. Soft, downy material has already been made from the light, fluffy portion of feathers, so don't be surprised to see it soon in some exclusive shops.

Science News Letter, July 21, 1945

PUBLIC HEALTH

No Increase in Polio During Week of July 7

► AS IF to confirm assurances by health authorities that infantile paralysis gives no signs yet of becoming epidemic this season, the total number of cases throughout the nation remained practically stationary during the week ending July 7.

The number reported for that week to the U. S. Public Health Service was 154. The total for the previous week was 155. For the first week in July, 1944, the total was 288.

Texas, where the greatest concentration of cases so far has occurred, reported 21 cases the week of July 7, compared to 54 the previous week. Tennessee, New York and California reported some increases.

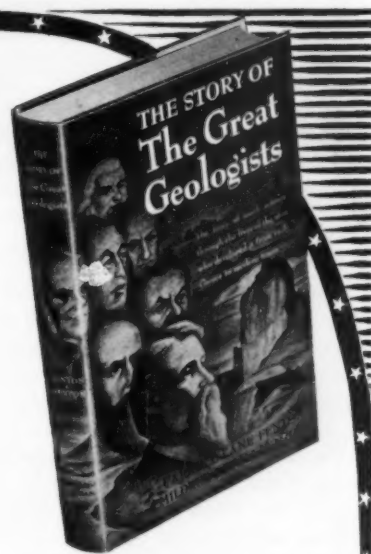
Science News Letter, July 21, 1945

MINERALOGY

Mineral Rehabilitation Planned for New Jersey

► USE as a water softener of New Jersey marl or greensand, formerly important as a fertilizer, has inspired a program of rehabilitation and expansion for New Jersey's mineral industry which has dwindled recently. A new bureau of mineral research at Rutgers University, headed by Dr. Alfred K. Snelgrove, formerly of Michigan College of Mining and Technology, will conduct the study.

Science News Letter, July 21, 1945



*These men
discovered
the Earth*

THE STORY OF The Great Geologists

By Carroll Lane Fenton
and Mildred Adams Fenton

TWO outstanding scientists tell the fascinating story of the development of earth science, through the lives of 35 great geologists, interrelating the account of their scientific work with the story of their lives. With a popular, yet scientifically accurate approach, the authors show the relationship between geological discoveries and the historical conditions that nourished them.

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DOUBLEDAY, DORAN

Do You Know?

The more nearly pure *water* is, the less it conducts electricity.

The cells of a *honeycomb* are seldom actually symmetrical.

The average life of a 60-watt incandescent *bulb* is 1,000 hours of burning.

Poison ivy, poison oak, and poison sumac all contain *urushiol*, which is the irritant.

Sweet potatoes are not as exacting in their soil requirements as white potatoes and are therefore probably easier to grow.

Freon - 12, difluorodichloromethane, used for several years as a refrigerant in quick-freezing units, was little known to the public until employed in insect-killing bombs by the armed services.

Fabrication of hard, *heat-resistant glass* is now carried out by the use of radio-frequency electric current passing through the glass between two gas flames on opposite sides of the glass part.

The nation's newest national park, *Big Bend* in the Chisos country of Texas, is one of the most important geological sections of America because of the various geological stages passed by the area in formation.



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MEDICINE

Boric Acid Treatment

Is recommended as the only safe home remedy for athlete's foot by the A.M.A. Three new remedies get OK for use by doctors.

➤ BORIC ACID powder is recommended by the American Medical Association as a safe remedy, and the only safe home remedy, for athlete's foot.

The recommendation is given in a report by Dr. Fred R. Weidman, University of Pennsylvania School of Medicine, Dr. Chester W. Emmons, U. S. National Institute of Health, Dr. Joseph G. Hopkins, Columbia University College of Physicians and Surgeons, and Dr. George M. Lewis, Cornell University Medical School. Since the report covers studies made for the medical association's council on pharmacy and chemistry and is published by the council, its recommendations can probably be taken as coming from the association as well as the scientists reporting.

This "venture" into "the dangerous field of self-treatment" is made in recognition of the fact that, although self-treatment is considered unsafe, a large section of the public persists in treating many of its own ailments, at least in the early stages.

Three relatively new remedies, sodium propionate, undecylenic acid and Crestatin (metacresylacetate), are reported as useful for treatment given by physicians.

Hygiene of the feet is stated to be of paramount importance both in prevention and treatment of athlete's foot. Foot baths of hypochlorite and hyposulfite, however, are "becoming discredited."

Athlete's foot or, more specifically, fungus infection of the skin, is not found to predispose to skin trouble from contact with irritating substances such as industrial chemicals.

Although widely prevalent, with probably more than half the industrial workers of the country affected, athlete's foot has resulted in little manpower loss.

Self-treatment of athlete's foot, the report warns, should be limited to mild sores between the toes when the condition is limited to scaliness and perhaps mild redness and cracking. Considerable redness, moisture, formation of pimple-like bumps called pustules, or pain call for treatment by a physician and a physician only, it is emphasized.

If two weeks of the boric acid powder plus certain prophylactic measures do not

result in improvement, the patient should consult a physician.

The patient is warned "under no circumstances" to "yield to the well meant recommendations of friends and to advertisements."

"Preparations containing iodine, mercury or sulfur are particularly dangerous and the sulfonamides are notorious because they so frequently sensitize the individual to sulfonamide drugs which may be imperatively indicated later for a really serious ailment."

Prophylaxis for athlete's foot is given as follows:

1. Keep the feet clean and dry, with special attention to places between the toes. Dry these carefully but not so hard as to irritate the skin.

2. Air shoes and socks when not in use.

3. Under special conditions, keep the feet elevated when at rest (where the conditions predispose to intertrigo, as with marching soldiers).

4. Shoes should be selected that are as light and well aerated as is compatible with working conditions.

5. A dusting powder consisting of 10% boric acid in powdered talc should be dusted on the feet and between the toes every night and morning.

Science News Letter, July 21, 1945

CHEMISTRY

Germs Killed by Burdock Leaves Steeped in Water

➤ WATER-STEEPED green leaves of burdock, a common wayside weed used as medicine by the ancients, successfully kill certain bacteria, Dr. Chester J. Cavallito, Dr. John H. Bailey and Dr. Frederick K. Kirchner of Winthrop Chemical Co., Inc., state in the *Journal of the American Chemical Society*. Not as active as some of the other antibiotics, burdock's ability to kill germs is of particular interest because of the plentiful supply of this weed and because the toxicity to mice is relatively low.

Science News Letter, July 21, 1945

The sometimes odoriferous *skunk* is a valuable night worker for the gardener because he lives largely on garden pests.

ANTHROPOLOGY

NATURE
RAMBLINGS

by Frank Thone



Odd Coins

► WHAT an assortment of things mankind has used (and still uses) for monetary purposes!

To the old gag question, "What'll we use for money?" the human race has apparently chosen as a snappy come-back, "Oh, 'most anything!"

You can hardly name a substance or commodity that has not been used as a medium of exchange. This does not mean as objects of barter (though the dividing line between bartering and buying with money is hard to draw) but as conventionally accepted, or even legally defined, coin of the realm.

Seashells of many kinds, either whole or cut up into disks, beads or other processed articles, have been used as money in practically all parts of the world. The wampum of our American Indians, which had come to be a rather highly standardized basis of trade before the arrival of the white man, was made of very tiny shell beads—perhaps the most elaborately processed of all shell "coins." Contrast with that the use of unmodified cowrie shells in the Pacific islands—objects of great beauty in themselves, with the added value of always being scarce.

Small boys, swapping knives, may seem to be indulging in pure barter. But iron knives are standard coin in large parts of Africa right now. Knife money seems to have been very widely current in past times. Some of the earliest coinage in China was in terms of knives. The antiquity of the practice is well demonstrated by the fact that the knives, at first usable as tools, then merely knife-shaped flat pieces of metal, were always made of bronze or brass, never of iron.

The Chinese knife money had round-ended handles with holes bored in them for the passage of a string. The present-day holed "cash," the smallest of small change in China, are said to be the last

survivors of these round-ended knife handles. Some of the African knife money presents an interesting parallel, for it consists of somewhat exaggerated handles with hardly a trace of the blades. Primitive African money, however, is of iron: Negroes passed from the use of stone directly to that of iron, without any intervening Bronze Age. They may have been the world's first blacksmiths.

Our own insistence on gold as the

only "real" money may have roots just as primitive. We commonly say that gold is so highly valued because of its rarity, its beauty, its resistance to oxidation. But it is highly probable that nugget gold was the first of all metals to be used by human beings, antedating even copper. Isn't it at least likely that this also was a factor in setting it up in the esteem of all succeeding generations?

Science News Letter, July 21, 1945

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These New
Advantages!

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- ✓ **Completely waterproof**—can be immersed in sea water without harm.
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Official U.S. Navy Photo

NAVY MEN DEPEND ON PRECISION BINOCULARS... Guarding the lives of hundreds of men, these advance lookouts rely on the superior performance of high quality binoculars. They know that a far-away object on the horizon can be quickly identified with these powerful glasses. The name Bausch & Lomb has long stood for such *optical precision*. The world's finest binocular today is Bausch & Lomb.

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Books of the Week

► IF YOU WANT TO KNOW what part hunches and lucky accidents have played in scientific discoveries, how a scientist thinks and feels and works, and what makes a scientist, read **THE WAY OF AN INVESTIGATOR**, by Walter B. Cannon (*Norton*, \$3). Young men and women embarking on careers in science particularly will find much in this book to inspire and guide them.

Science News Letter, July 21, 1945

Just Off the Press

BOOKS, PUBLICATIONS, AND PATENTS OF THE BATTELLE MEMORIAL INSTITUTE STAFF—Thelma R. Reinberg, comp.—*Battelle Memorial Institute*, paper, 72 p., illus., free.

CHARACTER-ANALYSIS: Principles and Technique for Psychoanalysts in Practice and in Training—Wilhelm Reich—*Orgone Inst. Press*, 328 p., \$4.50. A technical book on psychoanalysis. 2nd ed., trans. by Theodore P. Wolfe.

THE CHEMISTRY OF ACETYLENE—Julius A. Nieuwland and Richard R. Vogt—*Reinhold*, 219 p., illus., \$4. Amer. Chem. Soc. monograph series.

GENETICS—Edgar Altenburg—*Holt*, 452 p., illus., \$3.20. A college textbook.

A GUIDE ON ALCOHOLISM FOR SOCIAL WORKERS—Robert V. Seliger and Victoria Cranford—*Alcoholism Pub.*, paper, 94 p., \$2. War ed., first printing.

REDUCING DAMAGE TO EGGS AND EGG CASES—U. S. Dept. of Agriculture—*Supt. of Documents*, paper, 24 p., illus., 10 cents. Misc. Pub. No. 564.

STANOLUBE HD—*Standard Oil Co.*, paper, 43 p., illus., free. The meaning of HD in a superior type motor oil for heavy duty service. Technical Bulletin No. 45—1.

THE STORY OF WAR WEAPONS—Marshall McClintock—*Lippincott*, 173 p., illus.,

\$2.50. A Stokes book for boys and girls.

STRAIGHT TALK FOR DISABLED VETERANS—Edna Yost and Lillian M. Gilbreth—*Public Affairs Press*, paper, 32 p., illus., 10 cents. Public Affairs Pamphlet No. 106.

TEXTBOOK OF NEUROPATHOLOGY—Arthur Weil—*Grunne*, 356 p., illus., \$5.50. 2nd ed., revised and enlarged. A textbook and reference manual.

YOUR PERSONAL PLANE—John Paul Andrews—*Duell*, 230 p., illus., \$2.50. An introduction by Henry A. Wallace, and an appendix giving the CAA directory of airports.

Science News Letter, July 21, 1945

ENGINEERING

Cubes of Coal Wrapped in Neat Paper Bundles

► CUBES of coal, neatly wrapped in paper, may eventually be sold at the grocery or filling station. Specially blended coal cubes in Philadelphia are already appearing in packages weighing only a trifle more than seven pounds, but at present are delivered only in ton lots, and principally through dealers.

Known as White Glove Packaged Fuel because of their cleanliness, the three-inch cubes are made from anthracite and bituminous fines, small particles of top-grade coal, held together by an oil-base binder.

Fuel packaged in such a convenient size does away with the coal bin and its attendant dirt. Stacked neatly next to the furnace, stove or fireplace, the package containing six cubes may be thrown into the fire, wrapping and all.

It burns to a minimum of fine white ash and does not form clinkers.

Science News Letter, July 21, 1945

PHYSICS

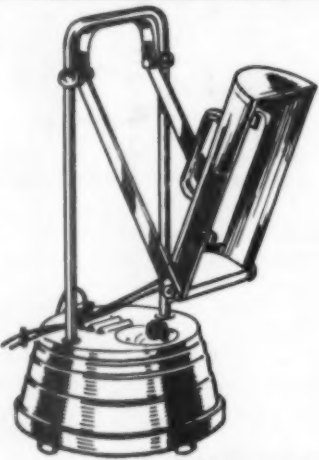
Rocket Propulsion Powder Inspected by X-Rays

► SO-CALLED grains of rocket-propulsion powder, in reality sticks of a highly combustible material that provide the gas to drive the jet-propelled war weapon, are successfully and rapidly inspected for flaws by X-ray equipment, it is now revealed. These extruded sticks of powder, made from a paste-like mixture, sometimes contain airpockets and, if used, may cause the rocket to overshoot or fall short of its target.

A regular industrial X-ray equipment, made by Westinghouse, is proving highly satisfactory at the plant of the Hercules Powder Company, where the rocket grains are made. The grains are passed through the X-ray apparatus and a film record is made on which flaws or airpockets may be easily seen. Imperfect sticks are rejected.

Rockets employ a jet of expanding gas, escaping through a narrow aperture at the rear, for their forward push. The gas is generated by the ignition of a powder charge carried in the center section of the rocket, just back of its explosive head. A relatively slow-burning fire is necessary to generate the gas in a smooth, even flow with no variations in pressure. It is for this reason that the grains must be without air pockets.

Science News Letter, July 21, 1945



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MODEL A-1

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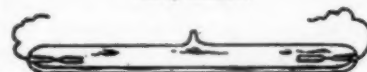
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THE DIFFERENCE BETWEEN *Sun-Kraft* QUARTZ ULTRAVIOLET RAY TUBE AND CONVENTIONAL TYPE QUARTZ TUBE

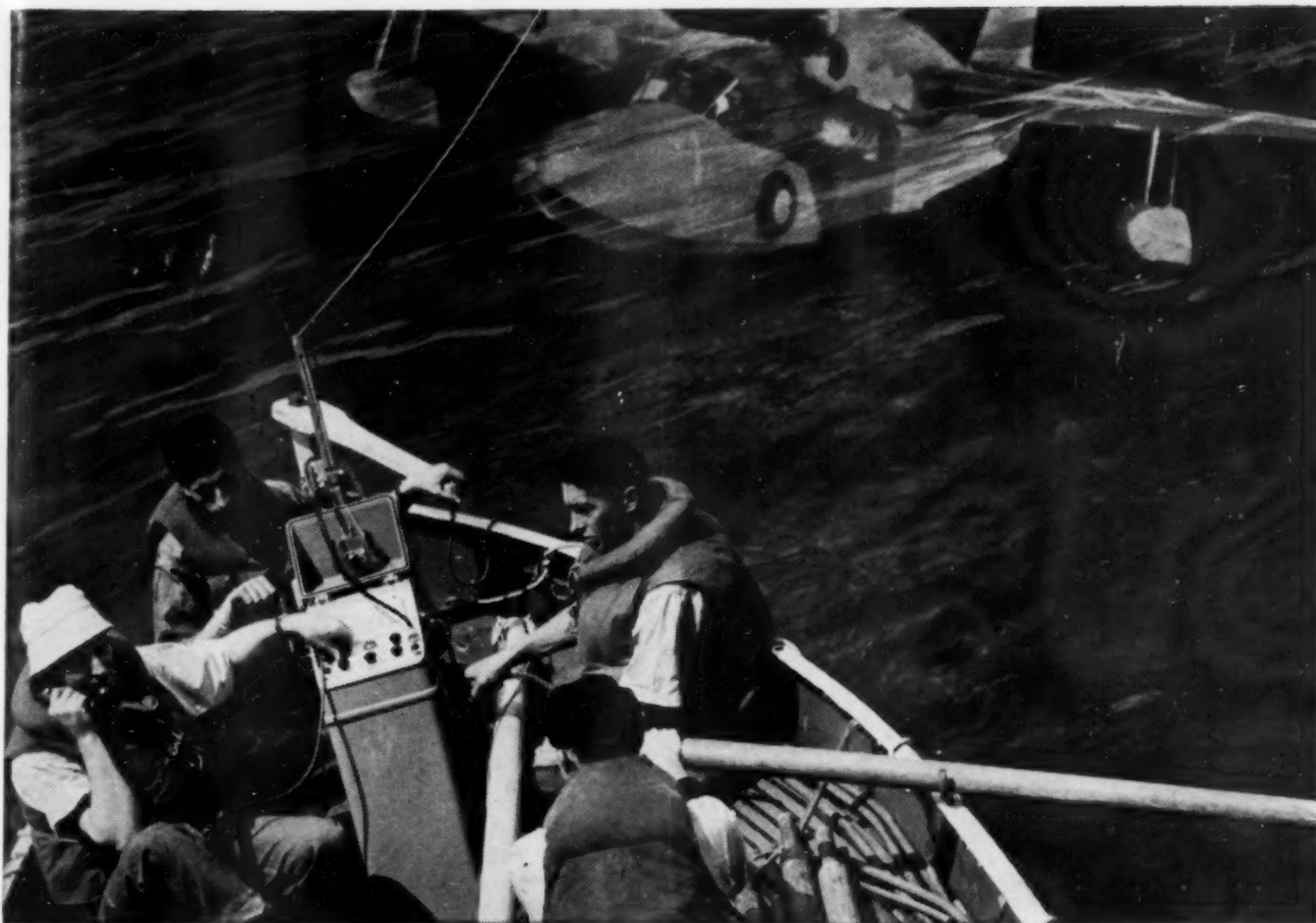


Sun-Kraft "No filament, burn-out-proof" super transparent quartz tube can not burn out, can not fog, develop black spots or weaken in ultraviolet radiation. Costly replacements are entirely eliminated.



Conventional type electrode or filament activated tube. Deteriorates quickly because of the fused in metal. It will develop black spots fast, reducing ultraviolet radiation and eventually burning out entirely, necessitating costly replacements.

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"HOW TO USE
YOUR
SUN-KRAFT"



With the new RCA lifeboat radio, shipwrecks need no longer take a terrible toll of lives.

A two-way radiophone—for lifeboats!

Here's when a telephone comes in rather handy . . . when you can "get your party" and hear "We'll be there to get you in a couple of hours!"

With the new RCA compact lifeboat radio, that's exactly what happens. A kite, or a balloon, takes the antenna up 300 feet.

Turn the power-generating cranks and out goes an SOS—along with a direction-finder beam so shore stations can figure your exact location.

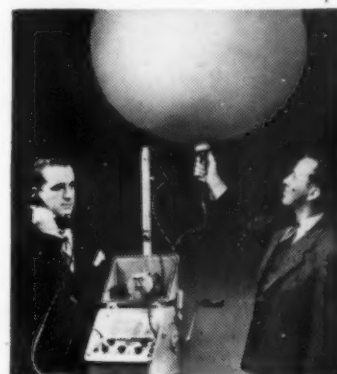
But even more amazing, shipwrecked mariners can talk with the men on their way to the rescue. They can "pick up" ships,

airplanes, and that wonderful place called "land"—even if it's 1000 miles away!

Endless research, such as went into developing this lifeboat radio, goes into all RCA products.

And when you buy an RCA Victor radio, or television set or Victrola, you enjoy a unique pride of ownership in knowing that you possess one of the finest instruments of its kind that science has achieved.

Radio Corporation of America, RCA Building, Radio City, New York 20. • *Listen to The RCA Show, Sundays, 4:30 P. M., E. W. T., over the NBC Network.*



Joseph McDonald and Donald Kolb (holding balloon) are the Radiomarine engineers who developed this lifeboat radio. Here is the balloon that is inflated with helium and carries the antenna as high as 300 feet into the air.



RADIO CORPORATION of AMERICA

• New Machines and Gadgets •

❁ **WIND DIRECTION** and velocity automatic recorder includes an electric generator, operated by the ordinary cup anemometer, the output of which varies with the speed. The rotor loop in the generator turns with the wind vane, its position being recorded electrically.

Science News Letter, July 21, 1945

❁ **SPECIAL RADIO** receivers, available only to service men overseas, are strong, light, compact and resistant to fungi and corrosion. Control panels are recessed with nothing protruding. The antennae reel into the back but can be unreeled quickly for use. The receivers contain their own batteries, either AC or DC.

Science News Letter, July 21, 1945

❁ **PENCIL-POINTING** device is a small tray for the desk with steel file set lengthwise in its center, the upper ridge of the file projecting above the tray. The edge of the tray forms a rest for the pencil while the point is pushed backward and forward against the file. The tray catches the debris.

Science News Letter, July 21, 1945

❁ **COLLAPSIBLE** crib for a baby has hinged joints in its frame so that it can be folded quickly into a compact unit for carrying or storage in an automobile trunk. The body is canvas and can be easily attached to the frame when opened.

Science News Letter, July 21, 1945

❁ **LABORATORY** mixer is made by fitting a mason jar top in a hole in the table top. The jar, containing materials



to be mixed, is screwed in place as shown in the picture. The shaft of the electric mixer projects through the jar top, as does also a funnel for adding additional material.

Science News Letter, July 21, 1945

❁ **MOISTURE-ABSORBING** device for a pipe-stem, cigar or cigarette holder, includes a removable absorbing material, round in shape but tapering from near its center toward the ends. The pipestem, the size of a cigarette, is held in place in a metal clasp with two spaced arms.

Science News Letter, July 21, 1945

❁ **COMBINATION ASHTRAY** and match-holder, pocket-size, consists of two hinged parts, one to hold a card of matches, the other the ashes and cigarette butts. An inside wall on the ash receiver prevents the contents from spilling, while a slide on it may be opened to insert ashes and butts.

Science News Letter, July 21, 1945

❁ **HOIST**, jack and wire stretcher, all in one, has the ordinary stand with a flat base, and a hook at the top so that it can be suspended. The movable part is a long chain with a hook at one end and with links that fit the gears of a wheel rotated by a lever.

Science News Letter, July 21, 1945

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 268.

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